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# IMPROVING POULTRY

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THROUGH THE  
NATIONAL POULTRY IMPROVEMENT PLAN



*This Emblem Identifies*  
**BREEDING STOCK  
HATCHING EGGS  
BABY CHICKS**

PRODUCED UNDER OFFICIAL SUPERVISION IN A CONSTRUCTIVE  
BREEDING and PULLORUM DISEASE CONTROL PROGRAM

FOR FURTHER INFORMATION CONSULT YOUR COUNTY AGRICULTURAL AGENT  
VOCATIONAL AGRICULTURAL TEACHER, STATE DEPARTMENT OF AGRICULTURE  
OR  
U.S. DEPARTMENT of AGRICULTURE

The poultry industry is demonstrating that effective improvement can be accomplished by the voluntary cooperative efforts of hatcherymen, flock owners, specialized poultry breeders, State poultry officials, and representatives of the United States Department of Agriculture. This is being done through the National Poultry Improvement Plan, a voluntary yet definitely organized program of breeding improvement and pullorum disease control.

In this publication an attempt has been made to describe the plan and its provisions and accomplishments in nontechnical language and to explain points in the plan that are of interest to the average poultryman. Participants in the plan, administrators, supervisors, and others interested in or concerned with the technical provisions should refer to Miscellaneous Publication No. 300, The National Poultry Improvement Plan, which may be obtained upon request from county agricultural agents, extension poultrymen, State Agricultural Colleges, or the Bureau of Animal Industry, United States Department of Agriculture, Washington, D. C.

The following mimeographed publications dealing with related subjects are also available from the Bureau of Animal Industry:

- A. H. D. No. 25, State Participation in the National Poultry Improvement Plan. This publication contains the name of the contact representative, the official State agency, and the breeding stages and pullorum classes being undertaken in each of the cooperating States.
- A. H. D. No. 35, U. S. Record of Performance Breeders Participating in the National Poultry Improvement Plan (published in January each year). This publication contains a list of U.S.R.O.P. breeders, listed by breeds, together with the number of flocks, number of candidates entered, and estimated number of females in U.S.R.O.P. matings.
- A. H. D. No. 36, Hatcheries Participating in the National Poultry Improvement Plan (published in January each year). This publication contains a list of cooperating hatcheries by States and shows the classification and egg capacity of each.
- A. H. D. No. 39, Directory of U. S. Register of Merit Sires and Dams (Including a Summary of their Family Performance) and Honor Roll of High Viability (published annually). This publication contains the names and address of U.S.R.O.P. breeders who have U.S.R.O.M. birds and lists the leg-band number of each U.S.R.O.M. sire and dam, together with its individual and family production record.



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## IMPROVING POULTRY THROUGH THE NATIONAL POULTRY IMPROVE- MENT PLAN

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### NEED FOR THE NATIONAL PLAN

When the hatchery industry in the United States began its period of rapid expansion, about 1920, progressive hatcherymen, breeders, and poultrymen began to see the need for organized poultry-improvement programs. The first State-wide poultry-improvement programs on an organized basis were started as early as 1918, but the number of States having such programs increased rapidly as the hatchery industry grew in importance.

While the State programs served a definite need, a great deal of confusion occurred because of the different meanings attached to the same official terms among the States. For example, the term "accredited" meant freedom from pullorum disease in certain States, while the same term in other States was used to designate breeding-improvement work similar to the present U. S. Approved work. As early as 1925 consideration was given to the development of a coordinated

<sup>1</sup>Revised by Paul B. Zumbro, senior poultry coordinator, Frank E. Moore, poultry coordinator, and Albert B. Godfrey, associate geneticist.

national plan with uniform provisions and terms. After 10 years of careful consideration of the problem by representative poultry leaders the National Poultry Improvement Plan was formulated and placed in operation July 1, 1935. It is now operating in 44 States.

The growth of participation in four phases of the plan is shown in figure 1. This growth is indicative of the confidence in and demand for poultry-improvement work on an organized national basis. It is

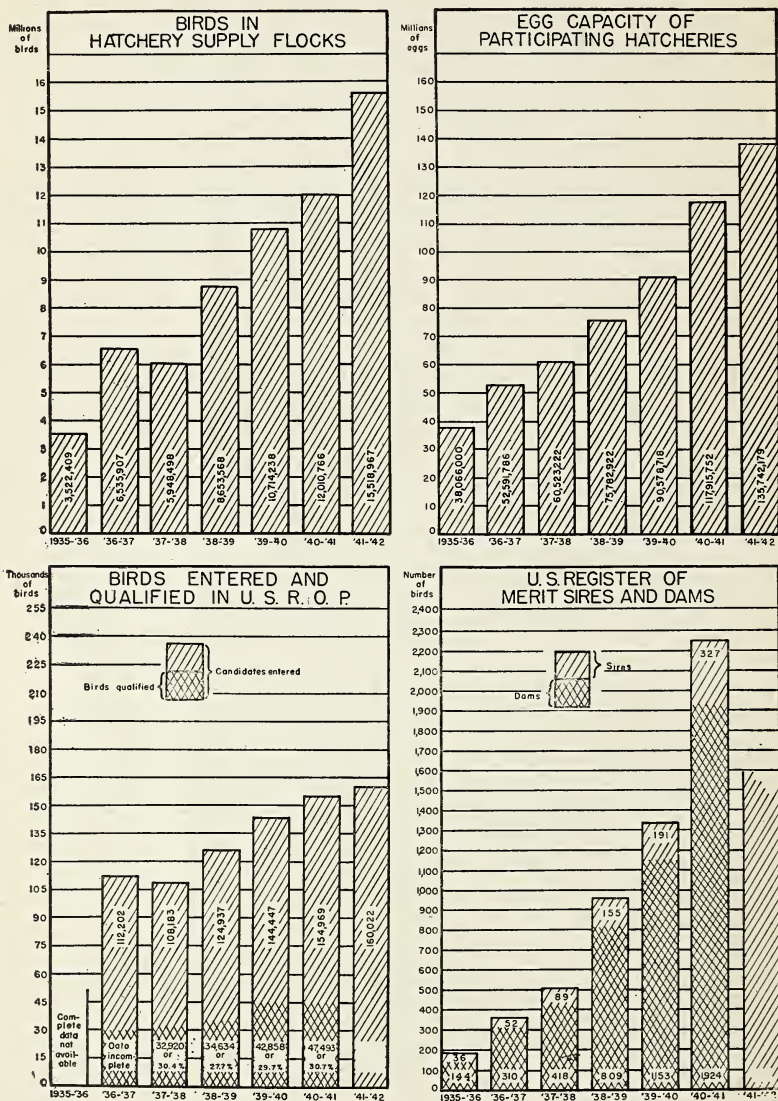


FIGURE 1.—Charts showing progress in poultry improvement by Federal, State, and commercial effort coordinated through the National Poultry Improvement Plan.

estimated that 35 percent of all commercially hatched chicks in the United States during 1942-43 were produced in hatcheries cooperating in the plan.

### ADMINISTRATION OF THE PLAN

The plan is administered cooperatively by an official State agency in each of the cooperating States and the Bureau of Animal Industry of the United States Department of Agriculture. The official State agency is usually the one that was administering the State poultry-improvement program prior to the adoption of the national plan; it may be the State department of agriculture, State college of agriculture, State poultry-improvement board or association, or similar organization recognized by the State government. Authority for an official State agency to administer the plan within the State is a memorandum of agreement between it and the Federal Bureau of Animal Industry. The agency directs, supervises, and is responsible for flock selection, testing for pullorum disease, flock and hatchery inspection, and other local administrative work involved in the operation of the plan. The Bureau of Animal Industry is responsible for coordinating the program among the cooperating States.

### WHO MAY PARTICIPATE AND HOW

Any poultry breeder, hatcheryman, or flock owner in a State having an official State agency for administering the plan may cooperate in the program by signing an agreement with that agency and complying with the provisions of the plan and the requirements of the official State agency. Following proper certification of the quality of his flocks or hatchery products by the State agency, the flock owner, hatcheryman, or poultry breeder may use the emblem (shown on cover page) and those designs and descriptive terms of the plan which are applicable in advertising his flock or hatchery products. The plan is Nation-wide. The adoption of the plan by a State or by an individual industry member is entirely voluntary, but a participant must meet the minimum requirements for the breeding stage and pullorum class in which he participates.

### HOW THE PLAN ASSISTS THE POULTRY INDUSTRY

The National Poultry Improvement Plan has been developed to assist the poultry industry in placing itself upon a more sound and efficient basis. This is being accomplished through (1) improving the efficiency of production of eggs and poultry meat by the general application of better breeding improvement practices; (2) reducing the losses of chicks from pullorum disease and improving the viability of poultry through better sanitary practices in breeding flocks and hatcheries; (3) the use of official terminology in the identification of breeding stock, hatching eggs, and chicks with respect to quality; and (4) the establishment of an effective cooperative program through which the best results from scientific research and practical experience can be most readily applied to the improvement of poultry and poultry products.



## SELECTION, TESTING, AND INSPECTION

All breeding birds used in any stage of the plan must be of a standard breed and variety (fig. 2). The males and females in the breeding flocks are selected individually for constitutional vigor and standard-bred and production qualities by authorized flock-selecting agents or State inspectors (fig. 3). At the time of selection each accepted bird is banded with a sealed and numbered official leg band. Flock-selecting agents are trained by the poultry department of the State college of agriculture or other properly constituted agency in standardbred and production judging and in the provisions of the plan as applied in the State before being authorized by the official State agency. Inspections of breeding flocks and hatcheries are made by State inspectors employed by the official State agencies.

The testing of birds for pullorum disease is done by a livestock sanitary official, a representative of the State college of agriculture, or a pullorum-testing agent who is authorized by the official State agency to do pullorum-testing work. Testing agents are required to take a course of training and pass an examination on (1) pullorum testing as prescribed by the State livestock sanitary authorities or officials of the State college of agriculture and (2) on the National Poultry Improvement Plan and official State agency provisions. In many cases the same person qualifies to do both flock-selecting and pullorum-testing work.

Participating breeders, hatcherymen, and flock owners are required to keep their premises and equipment in a sanitary condition. In addition, for the purpose of identification, and to aid in official inspections, hatcherymen keep records of the name and address of each flock owner, the number of eggs received from him, the name and address of each purchaser, and the number, breed, variety, and date of shipment of all chicks sold. Such records are open for official inspection at all times. Selection and testing are performed under the supervision of State inspectors, and breeding flocks and hatcheries are regularly inspected to insure compliance with official regulations and as an aid in effective improvement work.

## LABELS, DESIGNS, AND DESCRIPTIVE TERMS

For the purpose of identifying the products produced under the supervision of the plan, official labels are required to be used on each package of chicks or hatching eggs to indicate the exact breeding stage and pullorum class of the product. Each of the breeding stages and pullorum classes of the plan is named with a term that includes the prefix "U. S." If the purchaser finds the prefix "U. S.", he has the assurance that the chicks, hatching eggs, or stock were produced in accordance with the requirements of the plan.

A specific design in color, which is selected for attractiveness and ease of identification, is provided for each of the breeding stages and pullorum classes, as shown on pages 7 to 10. Use of the official terminology, the emblem, and the designs is limited to those who are participating in the plan and complying with its provisions.

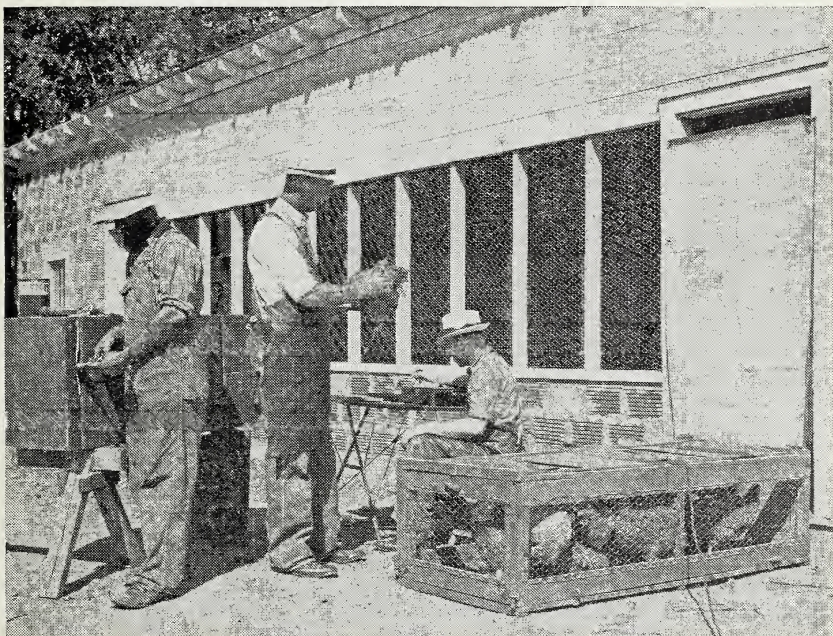
All advertising by participating members is subject to approval by the official State agency.





10001-B

FIGURE 2.—A typical hatching-egg supply flock. These birds, both males and females, have been individually selected for constitutional vigor, and standardbred and production qualities.



10012-A

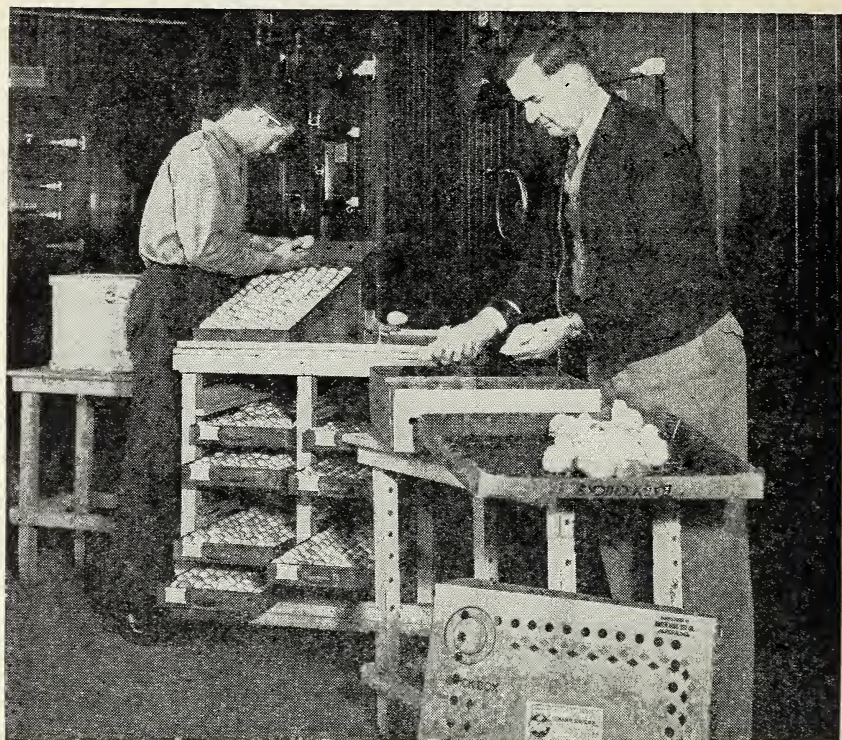
FIGURE 3.—Authorized agents selecting and testing a National Poultry Improvement plan breeding flock.



## BREEDING STAGES

The plan includes four progressive breeding stages, each having successively higher requirements in the following order: (1) U. S. Approved, (2) U. S. Certified, (3) U. S. Record of Performance, and (4) U. S. Register of Merit.

Minimum requirements are established for each breeding stage. However, an official State agency may set higher standards for the operations within a State, or an individual breeding farm or hatchery



67540-B

FIGURE 4.—Selecting hatching eggs for size, shape, color, and shell texture at a hatchery operating under the National Poultry Improvement Plan. Chicks sold by such a hatchery must be representative of the breed and variety.

may set higher standards for its own operations. The plan is not intended to limit a participant's efforts, but to encourage and stimulate interest in the use of the most advanced breeding and management methods known.

There are a number of general requirements that apply to all breeding stages and pullorum classes. All eggs used for hatching must be reasonably uniform in size and shape and sound in shell (fig. 4). In the case of all white-egg breeds, U. S. Approved hatching eggs are required to be reasonably free from tints and eggs of the other U. S. breeding stages are required to be free from tints. Only chicks that

are normal and representative of the breed and variety and that weigh at hatching time at least 8 pounds net per hundred are permitted to be sold as "plan" chicks.

#### U. S. APPROVED BREEDING STAGE

In the U. S. Approved breeding stage the males and females comprising the breeding flock are selected for constitutional vigor and standardbred and production qualities by flock-selecting agents or State inspectors.

Hatcheries producing U. S. Approved chicks must have all the breeding flocks from which they obtain hatching eggs selected annually by an authorized flock-selecting agent and approved by a State inspector. Each hatchery is inspected by a State inspector during the hatching season. Hatching eggs (fig. 4) are selected carefully for size, shape, color, and shell texture, and all hatching eggs must weigh at least  $11\frac{1}{2}$  ounces each, except that with the approval of the official state agency, eggs weighing 22 ounces to the dozen may be set during June, July, August, September, October, and November. Any U. S. Approved hatchery may produce and offer for sale only U. S. Approved or U. S. Record of Performance chicks of one variety. However, it may produce and sell U. S. Certified chicks of some other variety, but the hatchery retains the identity of the lower breeding stage, namely, U. S. Approved. Figure 5 shows the designs used for this breeding stage.

Provision is also made in the plan for the production of U. S. Approved crossbred hatching eggs and chicks. The parent stock must be well selected for good vitality, growth, market quality, egg production, feathering, and egg weight.



(GREEN)

FIGURE 5.—Design used to identify U. S. Approved flocks, eggs, chicks, and hatcheries.

#### U. S. CERTIFIED BREEDING STAGE

In the U. S. Certified breeding stage the females must meet the same requirements as in the U. S. Approved, but the males must be U. S. R. O. P. males. These males are described under U. S. Record of Performance Breeding Stage.



(YELLOW)

FIGURE 6.—Design used to identify U. S. Certified flocks, eggs, chicks, and hatcheries.

Hatcheries producing U. S. Certified chicks must have all the flocks from which they obtain hatching eggs inspected and certified by a State inspector. Each hatchery is inspected at least twice during the hatching season by an official inspector and all hatching eggs must weigh at least  $11\frac{1}{2}$  ounces each and average at least 24 ounces to the dozen, except that eggs weighing 22 ounces to the dozen may be set during June, July, August, September, October, and November. Figure 6 shows the design used for this breeding stage.



## U. S. RECORD OF PERFORMANCE BREEDING STAGE

The breeders in this stage carry on a very extensive program of trap nesting, pedigree breeding, and record keeping. All of their breeding operations must be under official supervision, and all candidates for U. S. R. O. P. and qualified U. S. R. O. P. females used in U. S. R. O. P. matings must be trap-nested. To meet the U. S. R. O. P. requirements a female must lay during 12 consecutive months at least 200 eggs that average 24 or more ounces to the dozen for the last 9 months, must be free from standard disqualifications, and must be a reasonably good representative of the breed and variety. The male progeny from U. S. R. O. P. matings (U. S. R. O. P. male  $\times$  U. S. R. O. P. females) may meet U. S. R. O. P. requirements at maturity if they meet proper physical requirements, are free from standard disqualifications, and are good representatives of the breed and variety as designated in the American Standard of Perfection. The chicks hatched from U. S. R. O. P. matings are individually pedigreed and officially wing-banded at hatching time. Detailed records are kept on trap-nesting, hatching, and wing-banding operations and on progeny performance. Figure 7 shows the design used for this breeding stage.

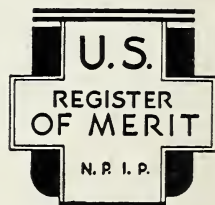


(BLUE)

FIGURE 7.—Design used to identify U. S. Record of Performance flocks, eggs, chicks, and breeding stock.

## U. S. REGISTER OF MERIT BREEDING STAGE

In this most advanced breeding stage recognition is given to sires and dams on the basis of the performance of their daughters. A male that heads a supervised single-male mating is considered a U. S. R. O. M. male when a minimum of 20 and at least one-third of his daughters entered under U. S. R. O. P. supervision qualify as U. S. R. O. P. females. A female member of a single-male mating qualifies for U. S. R. O. M. when a minimum of four and at least one-third of her daughters entered in U. S. R. O. P. qualify as U. S. R. O. P. females. Figure 8 shows the design used for this breeding stage.



(PURPLE)

FIGURE 8.—Design used to identify U. S. Register of Merit males, females, and matings.

## PULLORUM CLASSES

Pullorum disease (formerly called bacillary white diarrhea) is widespread. It exists in every section of the United States where appreciable numbers of poultry are kept. Heavy financial losses result from the deaths of baby chicks, lowered egg production in hens and pullets, reduced hatchability of eggs, and occasionally the death of hens due to generalized pullorum infection. Fortunately this disease may be controlled by making blood tests of the breeding

stock and removing all individuals that are infected. It is important also to employ reasonably sanitary methods in incubating and brooding chicks in order to prevent the spread of this infection.

The number of States with official testing programs and the volume of testing have increased rapidly since the National Poultry Improvement Plan became operative. During the seventh year of the operation of the plan (1941-42) the number of breeding birds officially tested was nearly as large as the total number of birds officially tested during the 15 years preceding operation of the plan. The percentage of reactors in officially conducted tests is continuing to be reduced with each successive year of testing.

In a great many States only those birds that are officially tested for pullorum disease are eligible for participation in the breeding stages of the plan. This will be a requirement in all the States after September 1, 1943.

Any one of the following methods may be used in testing chickens for pullorum disease: (1) Tube agglutination test, (2) stained-antigen, rapid, whole-blood test (fig. 3), and (3) rapid serum test. The plan provides four progressive pullorum classes, each having successively higher requirements in the following order: (1) U. S. Pullorum-Tested, (2) U. S. Pullorum-Controlled, (3) U. S. Pullorum-Passed, and (4) U. S. Pullorum-Clean (see figs. 9 to 12, inclusive).

#### U. S. PULLORUM-TESTED CLASS

All chickens 5 months of age or older to be retained as breeders are tested by a State pullorum tester or pullorum-testing agent and the reactors removed from the premises on completion of the test (fig. 3).

When the plan was first set up it was only necessary to test the birds in a breeding flock for pullorum disease and remove the reactors in order for the flock to qualify as U. S. Pullorum-Tested. There was no maximum percentage of reactors above which retests were required. Following the first year of operation, and continuing through 1940-41, the maximum tolerance for U. S. Pullorum-Tested flocks was less than 10 percent. Flocks containing 10 percent or more reactors on the first test were either rejected or required to be retested not sooner than 30 days after the first test and have less than 10 percent reactors before being able to qualify for this class. Starting in 1941-42 the maximum number of reactors permitted on the first test was less than 9 percent. The tolerance is being reduced 1 percent each year until in 1945-46 and thereafter it will be less than 5 percent. Testing work is done within 12 months

immediately preceding the date of sale of hatching eggs or chicks. All chickens introduced into breeding flocks at any time must be tested and be negative to the test. Figure 9 shows the design used for this pullorum class.

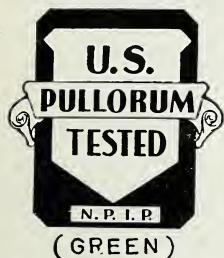


FIGURE 9. — Design used to identify U. S. Pullorum-Tested flocks, eggs, chicks, and hatcheries.



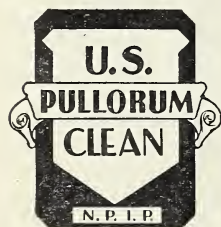
(YELLOW)

FIGURE 10. — Design used to identify U. S. Pullorum-Controlled flocks, eggs, chicks, and hatcheries.

hatching eggs, chicks, or breeding stock. Birds introduced into the flocks are from U. S. Pullorum-Passed or U. S. Pullorum-Clean flocks.

#### U. S. PULLORUM-CLEAN CLASS

All chickens over 5 months of age to be retained as breeders in Pullorum-Clean flocks are tested annually by a State inspector. Flocks to be so designated must not contain reactors in either of two consecutive tests not less than 6 months apart, the last test being made within the testing year immediately preceding the date of sale of hatching eggs, chicks, or breeding stock. Also,



(BLUE)

FIGURE 12. — Design used to identify U. S. Pullorum-Clean flocks, eggs, chicks, and hatcheries.

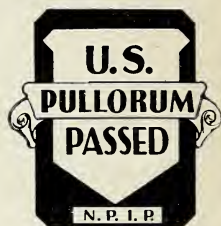
The principal benefits to be derived by buyers of chicks and breeding stock are (1) a consistent improvement in stock, leading to a more efficient production of better quality poultry products; (2) decreased mortality in chick and adult flocks, resulting from pullorum-disease control and better flock and hatchery sanitary practices; and (3)

#### U. S. PULLORUM-CONTROLLED CLASS

The requirements for this class are the same as for U. S. Pullorum-Tested, except that the number of reactors on the last test must be less than 2 percent. Figure 10 shows the design used for the pullorum-controlled class.

#### U. S. PULLORUM-PASSED CLASS

All chickens over 5 months of age in breeding flocks and on the same premises are tested by a State pullorum tester. U. S. Pullorum-Passed flocks do not contain any reactors on the last test made within the testing year immediately preceding date of sale of



(RED)

FIGURE 11. — Design used to identify U. S. Pullorum-Passed flocks, eggs, chicks, and hatcheries.

such a flock must have met the requirements of a U. S. Pullorum-Passed flock in the first test. Birds introduced into the flocks must be from only U. S. Pullorum-Clean flocks.

#### THOSE WHO WILL BENEFIT BY THE PLAN

The National Poultry Improvement Plan is based on tried breeding and pullorum-control practices that, over a period of years, have demonstrated their value in improving the breeding and production qualities of poultry and reducing losses from pullorum disease (fig. 13). Therefore its extensive and efficient operation over a sufficient period of years should greatly benefit the entire industry and the consumers of poultry products.



adequate information concerning the quality of stock available, so that it may be bought with confidence and with greater assurance of being the quality desired.

Flock owners who produce hatching eggs may expect (1) improvement of their own breeding flocks through selection, pullorum control, and suggestions as to the best management practices; and (2) availability of better foundation stock for the improvement of their flocks.

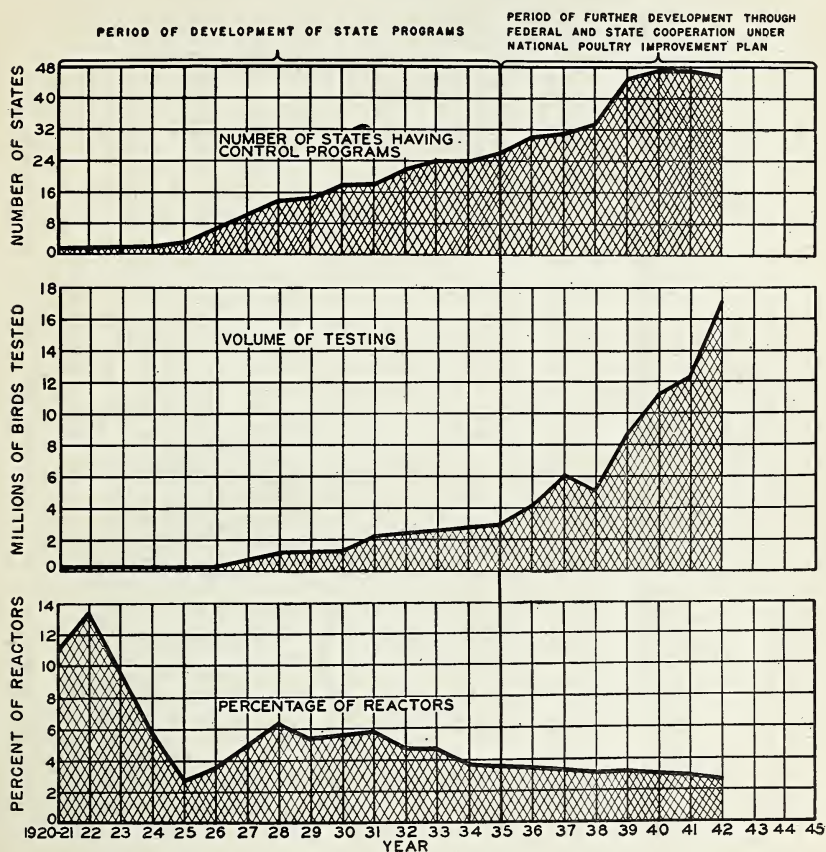


FIGURE 13.—Charts showing official pullorum disease control work in the United States.

Hatcherymen receive aid in numerous ways such as (1) official certification of the quality of products which they produce; (2) identification of good foundation male stock for their hatching-egg flocks; (3) better cooperation from their hatching-egg producers; (4) education of the poultry public regarding the quality and soundness of their production program; and (5) simple and essential records useful in the efficient and profitable operation of their business.

Poultry breeders doing trap-nesting and pedigree breeding are aided (1) in developing sounder breeding programs, (2) in obtaining the

most satisfactory type of forms for keeping records of all breeding operations and results, and (3) in the certification of their stock on the basis of its merit.

Evidence of the value of advanced breeding work from the standpoint of egg production is illustrated in the following data:

Average annual egg production per laying hen on farms in United States, 1941-----	110
Average annual egg production of pedigreed U.S.R.O.P. candidates, 1940-41 (trap-nest record year)-----	171
Average annual egg production of daughters of U.S.R.O.M. sires, 1940-41--	198
Average annual egg production of daughters of U.S.R.O.M. dams, 1940-41—	207

Marketing agencies and the consuming public also benefit materially from the greater uniformity and superior quality of eggs and poultry meat resulting from the cooperation of the breeder and hatchery industry in the national plan.





